

# **Kramer Electronics, Ltd.**



## **USER MANUAL**

### **Models:**

***VS-88A, 8 x 8 Balanced Audio Matrix Switcher***

***VS-88V, 8 x 8 Video Matrix Switcher***

***SD-7588V, 8 x 8 SDI Matrix Switcher***

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Getting Started</b>	<b>1</b>
2.1	Quick Start	2
<b>3</b>	<b>Overview</b>	<b>3</b>
<b>4</b>	<b>Your Matrix Switchers</b>	<b>3</b>
4.1	Your VS-88A 8 x 8 Balanced Audio Matrix Switcher	4
4.2	Your VS-88V 8x8 Video Matrix Switcher	7
4.3	Your SD-7588V 8x8 SDI Matrix Switcher	10
<b>5</b>	<b>Installing in a Rack</b>	<b>13</b>
<b>6</b>	<b>Connecting Your 88 Series Matrix Switchers</b>	<b>14</b>
6.1	Connecting a VS-88A	15
6.2	Connecting a VS-88V	16
6.3	Connecting an SD-5788V	17
6.4	Connecting the Stereo Audio Input/Output	18
6.5	Connecting Several Units and the PC	18
6.6	Connecting a Component, Y/C, RGBS or RGBHV Switcher	19
<b>7</b>	<b>Operation</b>	<b>20</b>
7.1	Understanding Modes	20
7.1.1	System Modes	21
7.1.2	Confirmation Modes	21
7.2	Setup Information	22
7.2.1	Setting DIP-Switches	22
7.2.2	Setup Capacity	23
7.2.3	Switching the Power On	23
7.2.4	Timeout and Priority	23
7.3	Using the Pushbutton Controls	23
7.3.1	Storing a Setting	23
7.3.2	Recalling a Setting	24
7.3.3	Locking and Unlocking Settings	24
<b>8</b>	<b>Technical Specifications</b>	<b>24</b>

## Figures

Figure 1: VS-88A 8x8 Balanced Audio Matrix Switcher	5
Figure 2: VS-88V 8x8 Video Matrix Switcher	8
Figure 3: SD-7588V 8x8 SDI Matrix Switcher	11
Figure 4: Connecting the VS-88A	15
Figure 5: Connecting the VS-88V	16
Figure 6: Connecting the SD-5788V	17
Figure 7: Connecting a Balanced Stereo Audio Input and Output	18
Figure 8: Connecting an Unbalanced Stereo Audio Input	18
Figure 9: Connecting an Unbalanced Stereo Audio Output	18
Figure 10: System Connection: Switchers and the PC	19
Figure 11: Component Switcher: VS-88V Group Connection	20
Figure 12: Rear Panel DIP-switches	22

## Tables

Table 1: VS-88A 8x8 Balanced Audio Matrix Switcher Features	6
Table 2: VS-88V 8x8 Video Matrix Switcher Features	9
Table 3: SD-7588V 8x8 SDI Matrix Switcher Features	12
Table 4: Rear Panel DIP-switches	22
Table 5: Machine # DIP-switch Settings	22
Table 6: Push Button Sequence Summary	24
Table 7: Technical Specifications for the VS-88A	25
Table 8: Technical Specifications for the VS-88V	25
Table 9: Technical Specifications for the SD-7588V	25

## 1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups<sup>1</sup> that are clearly defined by function.

Thank you for purchasing your Kramer *88 Series* switcher: **VS-88A**, **VS-88V**, and/or **SD-7588V**. These products are ideal for:

- Broadcast studios for on-air switching and signal routing
- Production studios, for connecting various sources to acceptors
- Non-linear editing suites and presentation applications

Each switcher package also includes the following items:

- Power cord<sup>2</sup>
- Windows<sup>®</sup>-based Kramer control software<sup>3</sup>
- This user manual<sup>4</sup>

## 2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables<sup>5</sup>

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1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 We recommend that you use only the power cord supplied with this device

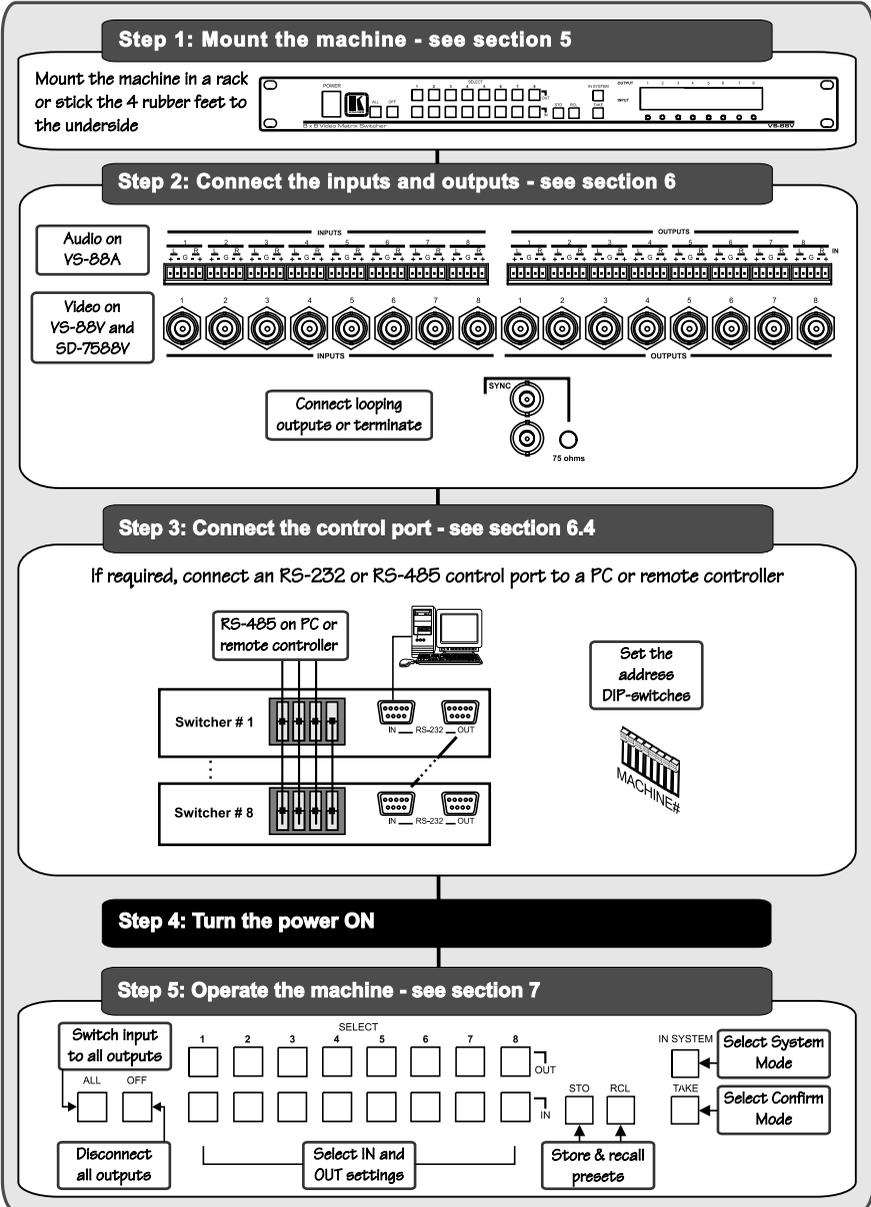
3 Downloadable from our Web site at <http://www.kramerelectronics.com>

4 Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com>

5 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

## 2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



### 3 Overview

The *88 Series* is a group of 8x8 vertical interval matrix switchers for video/stereo audio/data signals that support the simultaneous connection of one or more inputs to several outputs<sup>1</sup>.

The major innovation with the 88 Series is the ability to switch different kinds of signals simultaneously. Vertical interval switching ensures an undisturbed picture transition. Switching is implemented according to the SMPTE RP-168 standard, when using synchronized SDI sources.

The *88 Series* includes the following items:

- **VS-88A** 8 x 8 *Balanced Audio Matrix Switcher*
- **VS-88V** 8 x 8 *Video Matrix Switcher*
- **SD-7588V** 8 x 8 *SDI Matrix Switcher*

To achieve the best performance:

- Use only good quality connection cables<sup>2</sup> to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer products away from moisture, excessive sunlight and dust

### 4 Your Matrix Switchers

This section describes the products<sup>3</sup> in the *88 Series* range that can function separately<sup>4</sup> or switch together in the same manner in the *In System* mode<sup>5</sup>.

---

1 However, you cannot connect two or more inputs to a single output

2 Available from Kramer Electronics on our Web site at <http://www.kramerelectronics.com>

3 Switchers in the *88 Series* share identical front panel controls. The VS-88V and SD-7588V have rear panel BNC connectors. The VS-88A has rear panel detachable terminal block connectors

4 Standalone

5 Section 7.1 describes the different modes

## 4.1 Your VS-88A 8 x 8 Balanced Audio Matrix Switcher

The **VS-88A** is a high-performance 8x8 stereo audio matrix switcher for balanced audio stereo signals using detachable terminal block connectors. In addition, the **VS-88A**:

- Is a true matrix switcher, enabling the user to simultaneously route any input to any or all outputs
- Delivers excellent audio performance ensuring that it remains transparent in almost any audio application
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily accessing the most frequently used configurations
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system<sup>1</sup>

*Figure 1* and *Table 1* define the **VS-88A**:

---

<sup>1</sup> Which includes digital and analog video, digital and analog audio and RS-422 control switchers. When integrated in a system, it switches together with the video during the vertical interval, thus supporting true IN SYSTEM mode

# Your Matrix Switchers

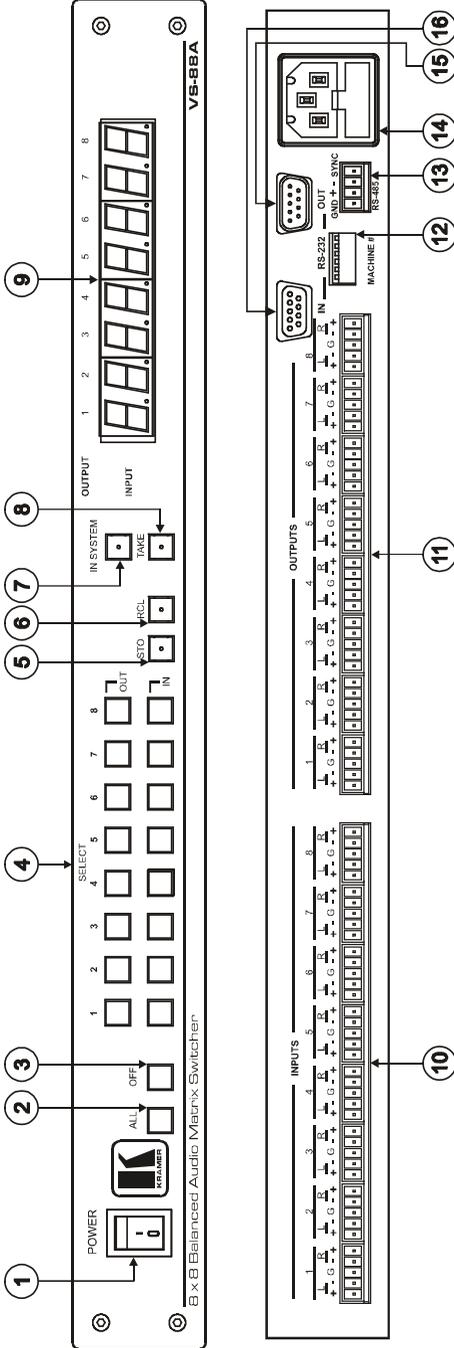


Figure 1: VS-88A 8x8 Balanced Audio Matrix Switcher

*Table 1: VS-88A 8x8 Balanced Audio Matrix Switcher Features*

#	Feature		Function
1	POWER Switch		Illuminated switch supplying power to the unit
2	ALL Button		Pressing <i>ALL</i> before pressing an <i>IN</i> button, connects that input to all outputs <sup>1</sup>
3	OFF Button		Pressing <i>OFF</i> after pressing an <i>OUT</i> button disconnects that output from the inputs. To turn off the connections, press the <i>ALL</i> button and then the <i>OFF</i> button
4	SELECT Buttons	OUT	Select the output to which the input is switched (from 1 to 8)
		IN	Select the input to switch to the output (from 1 to 8)
5	STO Button		Pressing <i>STO</i> (Store) followed by an output button stores the current setting (see section 7.3.1) <sup>2</sup>
6	RCL Button		Pressing the <i>RCL</i> (Recall) button and the corresponding <i>OUT</i> key recalls a setup. Press the <i>RCL</i> button again to implement the new status (see section 7.3.2)
7	IN SYSTEM Button		Pressing <i>IN SYSTEM</i> twice <sup>3</sup> , switches between the <i>Standalone</i> mode (in which the switcher implements any action independently from the others) and the <i>In System</i> mode (in which all switchers implement the same action simultaneously)
8	TAKE Button (TAKE = CONFIRM)		Pressing <i>TAKE</i> toggles the mode between the <i>CONFIRM</i> mode <sup>4</sup> and the <i>AT ONCE</i> mode (user confirmation per action is unnecessary)
9	OUTPUT labels		Identifies a connection between the output and the input shown below it
	INPUT Status Display		Displays the selected input switched to the output (marked above each input)
10	INPUT Terminal Block Connectors		Connect to balanced stereo audio sources (from 1 to 8)
11	OUTPUT Terminal Block Connectors		Connect to balanced stereo audio acceptors (from 1 to 8)
12	MACHINE #		DIP-switches setup (see section 7.2.1)
13	RS-485 Connector		RS-485 detachable terminal block port. Pins # 1 to # 3 are for RS 485 and pin # 4 is for vertical sync distribution <sup>5</sup>
14	Power Connector with Fuse		AC connector enabling power supply to the unit
15	RS-232 OUT 9-pin D-sub Connector		Connects to the RS-232 IN 9-pin D-sub port of the next unit in the daisy-chain connection <sup>6</sup>
16	RS-232 IN 9-pin D-sub Connector		Connects to PC

1 For example, press *ALL* and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press *STO* and then the Output button # 3 to store in Setup # 3

3 After pressing *IN SYSTEM* once, it blinks

4 When in Confirm mode, the *TAKE* button illuminates

5 The 88 Series RS-485 connector has 4 pins, and the Remote Controller RS-485 connector has just 3 pins

6 If the unit is the final unit in the daisy-chain connection, no termination is required

## 4.2 Your VS-88V 8x8 Video Matrix Switcher

The **VS-88V** is a high-performance 8x8 *Video Matrix Switcher* for composite video signals. In addition, the **VS-88V**:

- Is a true matrix switcher, enabling the user to simultaneously route any input to any or all outputs
- Supports more than 200MHz video bandwidth
- Switches during the vertical interval<sup>1</sup>
- Accepts analog video as the external source for its vertical interval trigger
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily accessing the most frequently used configurations
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system<sup>2</sup>
- Can be combined as part of a group of **VS-88V** switchers that comprise a component switcher<sup>3</sup>

*Figure 2* and *Table 2* define the **VS-88V**:

---

<sup>1</sup> Transitions are glitch-free when sources share a common reference sync

<sup>2</sup> Which includes digital and analog video, digital and analog audio, and RS-422 control switchers. When integrated into a system, it can provide the rest of switchers with the vertical interval trigger

<sup>3</sup> See section 6.6 and *Figure 11*

## Your Matrix Switchers

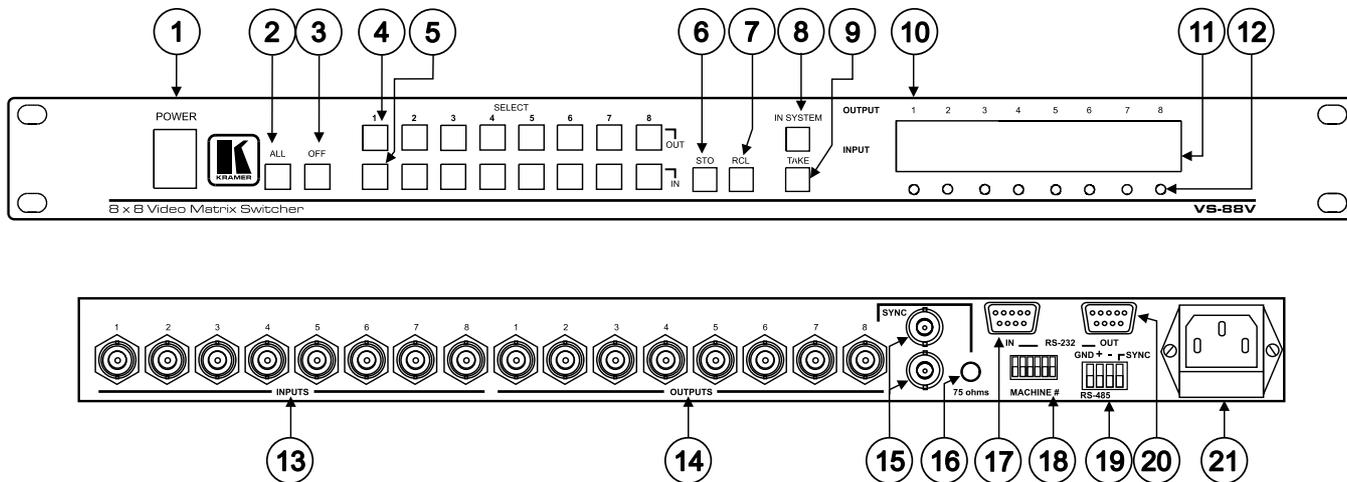


Figure 2: VS-88V 8x8 Video Matrix Switcher

## Your Matrix Switchers

*Table 2: VS-88V 8x8 Video Matrix Switcher Features*

#	Feature	Function
1	<i>POWER</i> Switch	Illuminated switch supplying power to the unit
2	<i>ALL</i> Button ( <i>ALL</i> = All Outputs)	Pressing <i>ALL</i> before pressing an <i>INPUT</i> button, connects that input to all outputs <sup>1</sup>
3	<i>OFF</i> Button ( <i>OFF</i> = All Inputs)	Pressing <i>OFF</i> after pressing an <i>OUTPUT</i> button disconnects that output from the inputs. To turn off the connections, press the <i>ALL</i> button and then the <i>OFF</i> button
4	<i>SELECT OUT</i> Buttons	Selects the output to which the input is switched (from 1 to 8)
5	<i>SELECT IN</i> Buttons	Selects the input to switch to the output (from 1 to 8)
6	<i>STO</i> Button	Pressing <i>STO</i> ( <i>STORE</i> ) followed by an output button stores the current setting (see section 7.3.1) <sup>2</sup>
7	<i>RCL</i> Button	Pressing the <i>RCL</i> ( <i>Recall</i> ) button and the corresponding <i>OUT</i> key recalls a setup. Press the <i>RCL</i> button again to implement the new status (see section 7.3.2)
8	<i>IN SYSTEM</i> Button	Pressing <i>IN SYSTEM</i> twice <sup>3</sup> , switches between the <i>Standalone</i> mode (in which the switcher implements any action independently from the others) and the <i>In System</i> mode (in which all switchers implement the same action simultaneously)
9	<i>TAKE</i> Button ( <i>TAKE</i> = <i>CONFIRM</i> )	Pressing <i>TAKE</i> toggles the mode between the <i>CONFIRM</i> mode <sup>4</sup> and the <i>AT ONCE</i> mode (user confirmation per action is unnecessary)
10	<i>OUTPUT</i> labels	Identifies a connection between the output and the input shown below it
11	<i>INPUT</i> Status Display	Displays the selected input switched to the output (marked above each input)
12	Input Status LEDs	Illuminates when the input signal is presented on a corresponding line and complies with the SDI standard
13	<i>INPUTS</i> BNC Connectors	Connects to the video sources (from 1 to 8)
14	<i>OUTPUTS</i> BNC Connectors	Connects to the video outputs (from 1 to 8)
15	<i>SYNC</i> BNC Connectors	For looping to external video sync input
16	<i>75 ohms</i> Button	Controls loop termination <sup>5</sup>
17	<i>RS-232 IN</i> 9-pin D-sub Connector	Connects to PC
18	<i>MACHINE #</i> DIP-switches	For setup of the machine number (see section 7.2.1)
19	<i>RS-485</i> Connector	<i>RS-485</i> detachable terminal block port. Pins # 1 to # 3 are for <i>RS-485</i> and pin # 4 is for vertical sync distribution <sup>6</sup>
20	<i>RS-232 OUT</i> 9-pin D-sub Connector	Connects to the <i>RS-232 IN</i> 9-pin D-sub port of the next unit in the daisy-chain connection <sup>7</sup>
21	Power Connector with Fuse	AC connector enabling power supply to the unit

1 For example, press *ALL* and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press *STO* and then the Output button # 3 to store in Setup # 3

3 After pressing *IN SYSTEM* once, it blinks

4 When in Confirm mode, the *TAKE* button illuminates

5 Push in to terminate the *SYNC* line. Push out when the line extends to another unit

6 The 88 Series *RS-485* connector has 4 pins

7 If the unit is the final unit in the daisy-chain connection, no termination is required

### 4.3 Your SD-7588V 8x8 SDI Matrix Switcher

The **SD-7588V** is a high-performance multi-standard 8x8 serial digital video matrix switcher that is adjustment-free, cable-equalized and reclocking. In addition, the **SD-7588V**:

- Provides automatic equalization for losses on 75 $\Omega$  coaxial cable, and reclocks each output to provide eight low-jitter serial digital outputs
- Automatic standard recognition
- Operates with both 10-bit and 8-bit video, automatically recognizing the word length
- Accepts analog video as the external source for its vertical interval trigger
- Is controllable via the front panel buttons as well as the built-in RS-232 and RS-485 interfaces
- Includes 15 preset memory locations for quickly and easily accessing the most frequently used configurations
- Functions as a standalone unit as well as part of a Kramer multi-signal switcher system<sup>1</sup>

*Figure 3* and *Table 3* define the **SD-7588V**:

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<sup>1</sup> Which includes digital and analog video, digital and analog audio, and RS-422 control switchers. When integrated into a system, it provides the rest of switchers with the vertical interval trigger

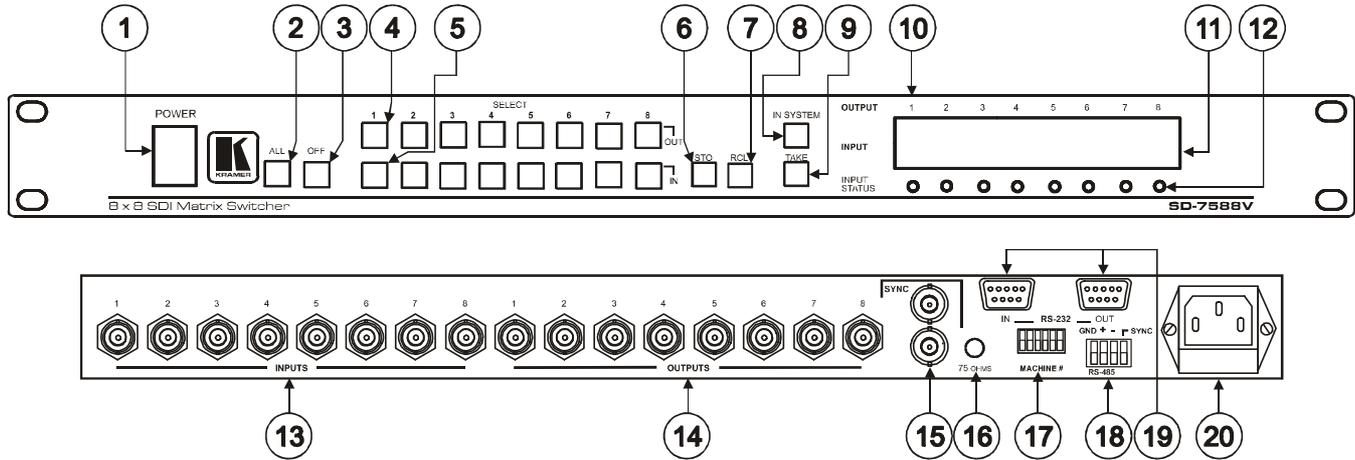


Figure 3: SD-7588V 8x8 SDI Matrix Switcher

Table 3 defines the features and functions of the **SD-7588V**:

Table 3: SD-7588V 8x8 SDI Matrix Switcher Features

#	Feature	Function	
1	Power Switch	Illuminated switch supplying power to the unit	
2	ALL Button (ALL= All Outputs)	Pressing ALL before pressing an INPUT button, connects that input to all outputs <sup>1</sup>	
3	OFF Button (OFF= All Inputs)	Pressing OFF after pressing an OUTPUT button disconnects that output from the inputs. To turn off the connections, press the ALL button and then the OFF button	
4	SELECT Buttons	OUT	Selects the output to which the input is switched
5		IN	Selects the input to switch to the output
6	STO Button	Pressing STO (STORE) followed by an output button stores the current setting (see section 7.3.1) <sup>2</sup>	
7	RCL Button	Pressing the RCL (Recall) button and the corresponding OUT key recalls a setup. Press the RCL button again to implement the new status	
8	IN SYSTEM Button	Pressing IN SYSTEM twice <sup>3</sup> , switches between the Standalone mode (in which the switcher implements any action independently from the others) and the In System mode (in which all switchers implement the same action simultaneously)	
9	TAKE Button (TAKE = CONFIRM)	Pressing TAKE toggles the mode between the CONFIRM mode <sup>4</sup> and the AT ONCE mode (user confirmation per action is unnecessary)	
10	OUTPUT Labels	Identifies a connection between the output and the input shown below it	
11	INPUT Status Display	Displays the selected input switched to the output (marked above each input)	
12	INPUT STATUS LEDs	Illuminates when the input signal is presented on a corresponding line and complies with the SDI standard	
13	INPUT BNC Connectors	Connects to the composite video sources (from 1 to 8)	
14	OUTPUT BNC Connectors	Connects to the composite video acceptors (from 1 to 8)	
15	SYNC BNC Connectors	For looping to external video sync input	
16	75 OHMS Button	Controls loop termination <sup>5</sup>	
17	MACHINE #	DIP-switches for setup of the machine number (see section 7.2.1)	
18	RS-485 Connector	RS-485 detachable terminal block port. Pins # 1 to # 3 are for RS 485 and pin # 4 is for vertical sync distribution <sup>6</sup>	
19	RS-232 9-pin D-sub Connectors	IN OUT	Connects to PC Connects to the RS-232 IN 9-pin D-sub port of the next unit in the daisy-chain connection <sup>7</sup>
20	Power Connector with Fuse	AC connector enabling power supply to the unit	

1 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

2 For example, press STO and then the Output button # 3 to store in Setup # 3

3 After pressing IN SYSTEM once, it blinks

4 When in Confirm mode, the TAKE button illuminates

5 Push in to terminate the SYNC line. Push out when the line extends to another unit

6 The 88 Series RS-485 connector has 4 pins, and the Remote Controller RS-485 connector has just 3 pins

7 If the unit is the final unit in the daisy-chain connection, no termination is required

## 5 Installing in a Rack

This section describes how to install the unit in a rack.

### Before Installing in a rack

Before installing in a rack, be sure that the environment is within the recommended range:	
Operating temperature range	+5° to +45° C (41° to 113° F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20° to +70° C (-4° to 158° F)
Storage humidity range	5 to 95% RHL, non-condensing



### CAUTION!!

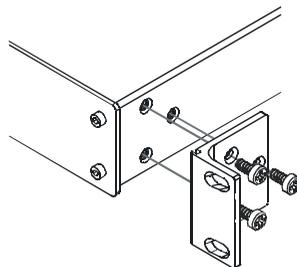
When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

### How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note that:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions (you can download it at: <http://www.kramerelectronics.com>)

## 6 Connecting Your 88 Series Matrix Switchers

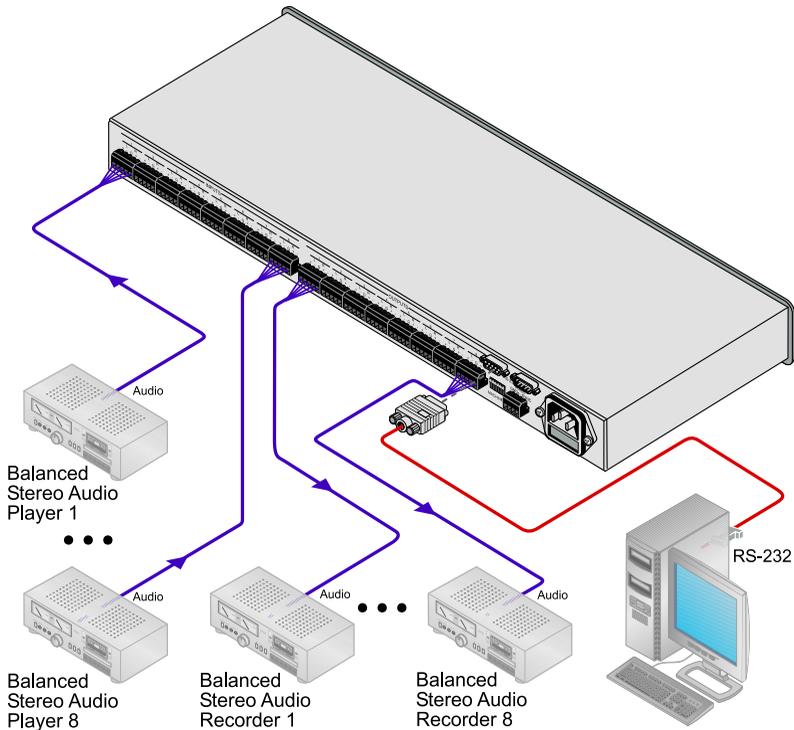
This section describes how to connect:

- A **VS-88A** standalone unit (see section 6.1)
- A **VS-88V** standalone unit (see section 6.2)
- An **SD-7588V** standalone unit (see section 6.3)
- A balanced or unbalanced stereo audio input or output (see section 6.4)
- Several units and the PC (see section 6.5)
- A component switcher (see section 6.6)

## 6.1 Connecting a VS-88A

To connect the **VS-88A** as shown in *Figure 4*:

1. Connect up to 8 balanced stereo audio sources<sup>1</sup> (for example, balanced stereo audio players) to INPUT terminal blocks 1 to 8.
2. Connect up to 8 balanced stereo audio acceptors<sup>1</sup> (for example, balanced stereo audio recorders) to OUTPUT terminal blocks 1 to 8.
3. If you are using a PC to control the device, connect the serial port of the controlling device to the RS-232 IN 9-pin D-sub connector.
4. Connect the power cord<sup>2</sup>.
5. Set DIP-switch # 1 OFF and DIP-switches # 2, 3, 4, 5 and 6 ON (see section 7.2.1). The IN SYSTEM button is non responsive.



*Figure 4: Connecting the VS-88A*

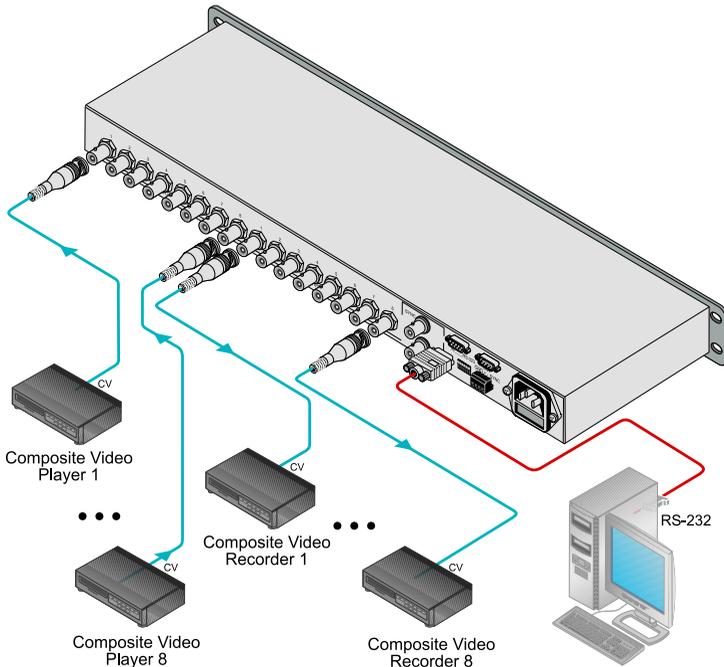
<sup>1</sup> You are not required to connect all inputs or outputs

<sup>2</sup> We recommend that you use only the power cord that is supplied with this machine

## 6.2 Connecting a VS-88V

To connect the **VS-88V** as shown in *Figure 5*:

1. Connect up to 8 composite video sources (for example, composite video players) to INPUT BNC connectors 1 to 8<sup>1</sup>.
2. Connect up to 8 composite video acceptors (for example, composite video recorders) to OUTPUT BNC connectors 1 to 8<sup>1</sup>.
3. Connect up to 2 video acceptors (for example, composite video displays (not shown)) to the looping SYNC BNC connectors.
4. If you are using a PC to control the device, connect the serial port of the controlling device to the RS-232 IN 9-pin D-sub connector.
5. Connect the power cord<sup>2</sup>.
6. Set DIP-switch # 1 OFF and DIP-switches # 2, 3, 4, 5 and 6 ON (see section 7.2.1). The IN SYSTEM button is non responsive.



*Figure 5: Connecting the VS-88V*

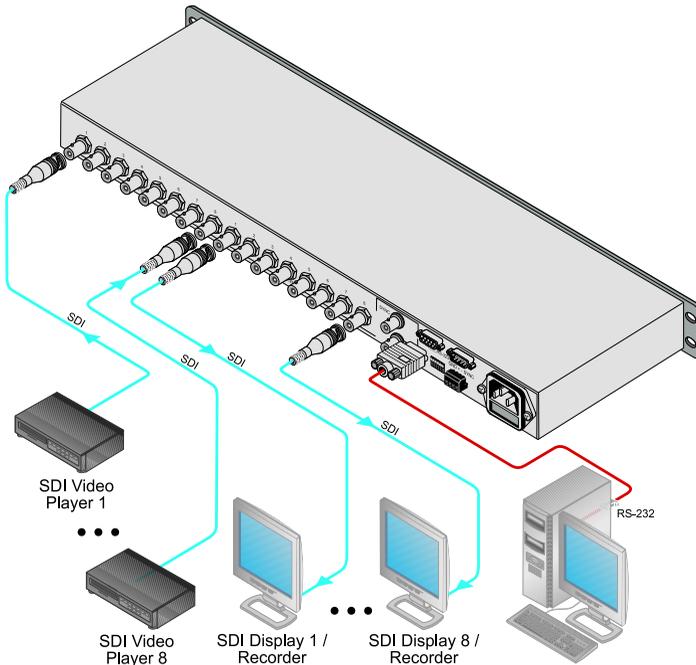
<sup>1</sup> You are not required to connect all inputs or outputs

<sup>2</sup> We recommend that you use only the power cord that is supplied with this machine

### 6.3 Connecting an SD-5788V

To connect the **SD-5788V** as shown in *Figure 6*:

1. Connect up to 8 SDI digital video sources (for example, SDI video players) to INPUT BNC connectors 1 to 8<sup>1</sup>.
2. Connect up to 8 SDI digital video acceptors (for example, SDI displays) to OUTPUT BNC connectors 1 to 8<sup>1</sup>.
3. Connect up to 2 video acceptors (for example, SDI displays (not shown)) to the looping SYNC BNC connectors or set the 75Ω termination switch.
4. If you are using a PC to control the device, connect the serial port of the controlling device to the RS-232 IN 9-pin D-sub connector.
5. Connect the power cord<sup>2</sup>.
6. Set DIP-switch # 1 OFF and DIP-switches # 2, 3, 4, 5 and 6 ON (see section 7.2.1). The IN SYSTEM button is non-responsive.



*Figure 6: Connecting the SD-5788V*

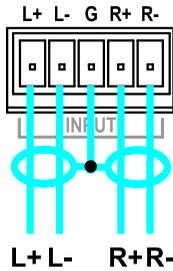
<sup>1</sup> You are not required to connect all inputs or outputs

<sup>2</sup> We recommend that you use only the power cord that is supplied with this machine

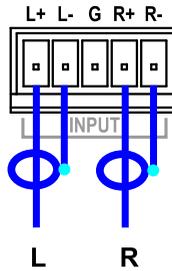
## 6.4 Connecting the Stereo Audio Input/Output

This section illustrates how to wire:

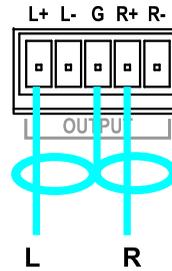
- A balanced stereo audio input and output, see *Figure 7*
- An unbalanced stereo audio input, see *Figure 8*
- An unbalanced stereo audio output, see *Figure 9*



*Figure 7: Connecting a Balanced Stereo Audio Input and Output*



*Figure 8: Connecting an Unbalanced Stereo Audio Input*



*Figure 9: Connecting an Unbalanced Stereo Audio Output*

## 6.5 Connecting Several Units and the PC

To connect several units and the PC:

1. Connect the power supply
2. Connect the audio and/or video input and output cables
3. Connect the video reference input (for video) for **VS-88V** and/or **SD-7588V**
4. Set the DIP-switches for the different MACHINE #. Set DIP-switch # 5 OFF and DIP-switch # 6 ON
5. Switchers in a daisy chain arrangement<sup>1</sup> using the RS-232 IN and RS-232 OUT 9-pin D-sub connectors should be connected using a flat-cable, or with at least the three wires (pins # 2, # 3 and # 5)<sup>2</sup>. **Do not use a null-modem adapter.** Assign PC port to 9600, N, 8, and 1

*Figure 10* illustrates a typical system connection with both<sup>3</sup> the RS-232 and the RS-485 connected in a parallel line:

<sup>1</sup> The 88 Series firmware complies with Kramer Protocol 2000 (version 3.1 and higher)

<sup>2</sup> Make one-to-one connections (that is, uncrossed)

<sup>3</sup> Often the PC has no RS-485 Com port and so both are required simultaneously

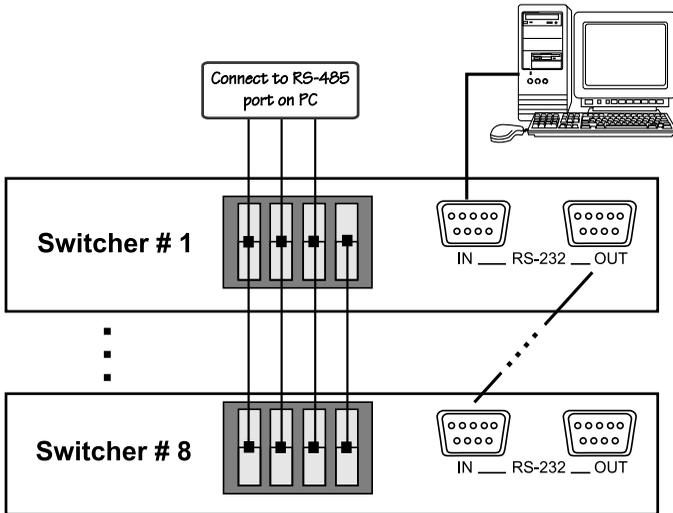


Figure 10: System Connection: Switchers and the PC

## 6.6 Connecting a Component<sup>1</sup>, Y/C, RGBS or RGBHV Switcher

A component<sup>2</sup> switcher consists of three **VS-88V** switchers, interconnected as one group, with one of the switchers set as the Master. A component switcher can function in the IN SYSTEM or standalone mode. Similarly, you can configure two **VS-88V** switchers for Y/C (s-Video), four **VS-88V** switchers for RGBS or five **VS-88V** switchers for RGBHV.

To set the **VS-88V** switchers in the group to operate as a single component switcher, do the following with every switcher in the group:

1. Set the same **MACHINE #** for each switcher (for example, **MACHINE # 2**).
2. Set **DIP-switch # 5 OFF**.
3. Set **DIP-switch # 6 OFF (except on the Master, set DIP-switch # 6 ON)**. Except for the Master (whose LEDs illuminate and front panel controls remain unlocked), the LEDs on all switchers in the group are dimmed, and their front panel controls are locked<sup>3</sup>.

<sup>1</sup> For RGB or YUV (Y, B-Y, R-Y)

<sup>2</sup> Video signal in component form offers the highest professional video quality, superior to composite or s-Video

<sup>3</sup> After initially powering up the component switcher, if some of its switchers remain in a different status, press the **ALL** button followed by the **OFF** button on the Master to reset all the connections prior to normal operation

Figure 11 illustrates a component switcher that consists of a group of 3 VS-88V switchers:

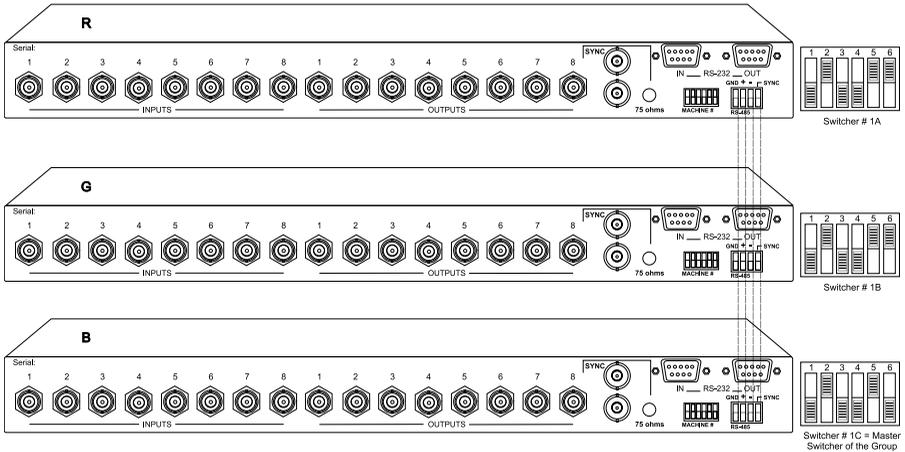


Figure 11: Component Switcher: VS-88V Group Connection

## 7 Operation

This section describes the modes, setup, and the operation of the devices using the front panel controls.

For instructions on using the Windows<sup>®</sup>-based Kramer control software, refer to the separate user manual<sup>1</sup>, *Kramer Control Software*.

### 7.1 Understanding Modes

A switcher operates in two System modes: Standalone and IN SYSTEM and in two Confirmation modes: AT ONCE and CONFIRM.

<sup>1</sup> Included on the CD-ROM in .pdf format

### 7.1.1 System Modes

By default, a switcher starts in the standalone mode and the IN SYSTEM key does not illuminate. Pressing the IN SYSTEM key twice toggles to the IN SYSTEM mode.

In the standalone mode:

- The switcher implements actions independently and separately from the others

In the IN SYSTEM mode:

- Several switchers with different kinds of signals are connected as a system operating as a universal switcher<sup>1</sup>
- More than one MACHINE IN SYSTEM # illuminates<sup>2</sup> to indicate the units that are connected as part of a system. Each MACHINE IN SYSTEM # for those IN SYSTEM units will not illuminate. However, on each of the IN SYSTEM units, the respective IN SYSTEM button continues to illuminate
- Any executed action affects all units in the system

### 7.1.2 Confirmation Modes

By default, the unit starts in the *AT ONCE* mode, that is, if an *OUT-IN* combination is pressed, it is implemented immediately. Pressing the TAKE button twice, toggles between the CONFIRM and the AT ONCE modes.

In the AT ONCE mode:

- You save time
- Actions require no user confirmation
- Execution is immediate
- No protection is offered to prevent the implementation of a wrongly entered action

In the CONFIRM mode:

- You have a method to help avoid making a mistake
- Every action requires user confirmation
- Execution is delayed until the user confirms the action
- Protection is offered to prevent erroneous switching

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<sup>1</sup> Each switches in the same order according to the entered command, with one or more of them following the other units

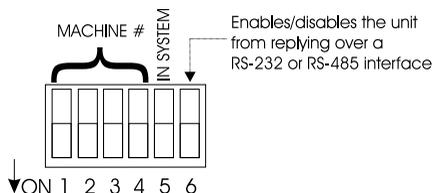
<sup>2</sup> The IN SYSTEM button on each unit also illuminates

## 7.2 Setup Information

This section describes setup capacity, switching the power on, timeout and the system settings.

### 7.2.1 Setting DIP-Switches

Each 88 Series switcher includes a rear panel set of six DIP-switches, as *Figure 12*, *Table 4* and *Table 5* define.



*Figure 12: Rear Panel DIP-switches*

*Table 4: Rear Panel DIP-switches*

DIP-switch #	Function:
1-4	Set the MACHINE NUMBER (refer to <i>Table 5</i> )
5	Disables use of the <i>IN SYSTEM</i> button (OFF = enables the <i>IN SYSTEM</i> button; ON = disables the <i>IN SYSTEM</i> button)
6	Enables a reply from the unit after it receives an RS-232 / RS-485 command (OFF = disables reply <sup>1</sup> ;ON = enables reply)

*Table 5: Machine # DIP-switch Settings*

MACHINE #	DIP-SWITCH			
	1	2	3	4
1	OFF	ON	ON	ON
2	ON	OFF	ON	ON
3	OFF	OFF	ON	ON
4	ON	ON	OFF	ON
5	OFF	ON	OFF	ON
6	ON	OFF	OFF	ON
7	OFF	OFF	OFF	ON
8	ON	ON	ON	OFF

<sup>1</sup> Helpful, for example, when using three composite video switchers to form one component video switcher

### 7.2.2 Setup Capacity

From every switcher you can store up to 8 setups. From the PC you can store up to 15 setups.

### 7.2.3 Switching the Power On

To switch the power on at all the switchers, do the following:

1. Verify, via the automatic self-test, that all switchers function correctly.
2. Check the firmware version number indicated by the two fast flashing digits on the display<sup>1</sup>.

### 7.2.4 Timeout and Priority

By design, every push button operation is subject to a 30 second timeout. Failure to fully execute an action within 30 seconds necessitates restarting that action while the LED display shows the previous state.

The unit has no control priority. Any operation, whether from the front panel or from a PC, overrides the previous system settings.

## 7.3 Using the Pushbutton Controls

This section describes how to store, recall and lock/unlock settings.

### 7.3.1 Storing a Setting

To store a setting, do the following:

1. Press the STO button. The STO button flashes.
2. Press the Output #. The LED Output display # flashes<sup>2</sup>.
3. Press the STO button again. The memory stores the data.
4. The LED display returns to its previous state<sup>3</sup>.

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<sup>1</sup> For example, the digits 10 indicate version 1.0

<sup>2</sup> At this stage, pressing a different # changes the output #

<sup>3</sup> Nothing changes in the setup

### 7.3.2 Recalling a Setting

To recall a setting, do the following:

1. Press the RCL button. The RCL button flashes.
2. Press the Output #. The LED Output display # flashes<sup>1</sup>, displaying what was previously stored.
3. Press the RCL button again. This recalls the stored data.

By design<sup>2</sup>, you cannot recall data that is stored in a particular unit from a different unit. Each unit, even when set to the IN SYSTEM mode, stores its own data separately.

### 7.3.3 Locking and Unlocking Settings

The PC includes a flexible locking<sup>3</sup> mechanism to safeguard settings on the switchers. To prevent changing the settings accidentally<sup>4</sup>, lock your switchers. Unlocking releases<sup>5</sup> the protection mechanism.

From the PC you can lock and unlock the following:

- A specific switcher
- All switchers

*Table 6: Push Button Sequence Summary*

	Lock	Unlock
Specific Switcher	TAKE + MACHINE IN SYSTEM # + STO	TAKE + MACHINE IN SYSTEM # + RCL
All Switchers	TAKE + ALL + STO	TAKE + ALL + RCL

## 8 Technical Specifications

*Table 7, Table 8, and Table 9* list the technical specifications for the 88 Series switchers.

1 At this stage, pressing a different # changes the Output #

2 On one occasion the same unit can function in the standalone mode, and on another occasion in the IN SYSTEM mode

3 Locking means that the front panel is locked. The switcher still operates via the PC

4 Especially if the system is complex and the switchers are stored on a rack in another room

5 Restarting a switcher also releases the protection mechanism (without wiping out the switcher settings)

## Technical Specifications

*Table 7: Technical Specifications for the VS-88A*

INPUTS:	8 balanced stereo audio, +4 dBm/33k $\Omega$ on detachable terminal blocks
OUTPUTS:	8 balanced audio stereo, +4 dBm/50 $\Omega$ Vpp max) on detachable terminal blocks
AUDIO BANDWIDTH:	> 40 kHz; 0.3db
AUDIO CROSSTALK:	< - 90 dB
AUDIO S/N:	> 90 dB unweighted (1Vpp)
AUDIO THD:	< 0.02% (1Vpp, 1kHz)
MAXIMAL AUDIO	20 dBm
DISPLAY:	Current switcher status on eight 7-segment bright LEDs
CONTROLS:	22 front-panel touch switches, RS-232 and RS-485 control interface
SWITCHING:	During vertical interval from Analog sync
DIMENSIONS:	19-inch (W) x 7-inch (D) x 1U (H), rack mountable
POWER SOURCE:	AC-110V/60Hz, 220V/50Hz (switchable inside the unit)
WEIGHT:	3.5 kg. (7.8 lbs.) approx.
ACCESSORIES:	Power cord, Windows <sup>®</sup> control software

*Table 8: Technical Specifications for the VS-88V*

INPUTS:	8 composite video, 1Vpp/75 $\Omega$ on BNCs, looping Analog sync inputs 1Vpp/75 $\Omega$ on BNCs
OUTPUTS:	8 composite video, 1Vpp/75 $\Omega$ on BNCs
VIDEO BANDWIDTH:	200 MHz 3dB
VIDEO CROSSTALK:	< -50 dB @ 5 MHz
VIDEO S/N:	>74 dB
DIFF. GAIN:	<0.05%
DIFF. PHASE:	<0.03 Deg
K-FACTOR:	< 0.05%
DISPLAY:	Current switcher status on eight 7-segment bright LEDs
CONTROLS:	22 front-panel touch switches, RS-232 and RS-485 control interface
SWITCHING:	During vertical interval from Analog sync
DIMENSIONS:	19-inch (W) x 7-inch (D) x 1U (H), rack mountable
POWER SOURCE:	AC-110V/60Hz, 220V/50Hz (switchable inside the unit)
WEIGHT:	3.5 kg. (7.8 lbs.) approx.
ACCESSORIES:	Power cord, Windows <sup>®</sup> control software

*Table 9: Technical Specifications for the SD-7588V*

INPUTS:	8 x SMPTE - 259M serial video, 75 $\Omega$ on BNCs; looping Analog sync inputs on BNCs
OUTPUTS:	8 reclocked SMPTE-259M outputs, 75 $\Omega$ on BNCs
RESOLUTION:	10-bit or 8-bit, automatic according to input resolution
STANDARDS:	4fsc PAL, 4fsc NTSC, 4:2:2 (525/625), and 360Mb/s wide screen (525/625)
EQUALIZATION:	Automatic for up to 300m for 270 Mb/s using Belden 8281 cable
DISPLAY:	Current switcher status on eight 7-segment bright LEDs. Signal presence for each channel on front panel LEDs
CONTROLS:	22 front-panel touch switches, RS-232 and RS-485 control interface
SWITCHING:	During vertical interval from Analog sync
DIMENSIONS:	19-inch (W) x 7-inch (D) x 1U (H), rack mountable
POWER SOURCE:	Universal, 85-264 VAC, 47-440 Hz, 25 VA max
WEIGHT:	3.5 kg. (7.8 lbs.) approx.
ACCESSORIES:	Power cord, Windows <sup>®</sup> control software

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## LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

### HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

### WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

### WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site [www.kramerelectronics.com](http://www.kramerelectronics.com).
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
  - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
  - ii) Product modification, or failure to follow instructions supplied with the product
  - iii) Repair or attempted repair by anyone not authorized by Kramer
  - iv) Any shipment of the product (claims must be presented to the carrier)
  - v) Removal or installation of the product
  - vi) Any other cause, which does not relate to a product defect
  - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

### WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

### HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

### LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

### EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

**NOTE:** All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);  
generic emission standard.  
Part I: Residential, commercial and light industry"  
EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.  
Part I: Residential, commercial and light industry environment".  
CFR-47: FCC\* Rules and Regulations:  
Part 15: "Radio frequency devices  
Subpart B Unintentional radiators"

### CAUTION!

- ☒ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ☒ Use the supplied DC power supply to feed power to the machine.
- ☒ Please use recommended interconnection cables to connect the machine to other components.  
\* FCC and CE approved using STP cable (for twisted pair products)



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**For the latest information on our products and a list of Kramer distributors, visit our Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com), where updates to this user manual may be found. We welcome your questions, comments and feedback.**



**Caution**

**Safety Warning:**

Disconnect the unit from the power supply before opening/servicing.



P/N:



2900-002011

Rev:



5

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**Kramer Electronics, Ltd.**

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**P/N: 2900-002011 REV 5**